

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (original) A photodetector using MOSFET with quantum channel, comprising:  
an SOI wafer activated;  
a quantum channel formed on the center of said SOI wafer activated;  
a gate oxide film covering said quantum channel;  
a source and a drain formed at both ends of said channel area; and  
metal layers connected with said source and said drain.
2. (original) The photodetector of claim 1, further comprising a gate formed additionally on said gate oxide film so as to control carrier current in said quantum channel, said gate being connected to the metal layers.
3. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said gate oxide film comprises oxides including SiO<sub>2</sub>.
4. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said MOSFET comprises N-P-N type MOSFET.
5. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said MOSFET comprises P-N-P type MOSFET.

6. (currently amended) The photodetector of claim 1 ~~or claim 3~~, wherein said gate oxide film has a depth of 1nm ~ 50nm.

7. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said both source and drain have a depth of less than 1000nm.

8. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said metal layers connected with said source and said drain comprise a metal selected from the group consisting of Al, Ti, W, In, Co, Au, Ni, and Cr.

9. (currently amended) The photodetector of claim 1 ~~or claim 2~~, wherein said metal layers connected with said source and said drain comprise a metal compound including a metal selected ~~from~~ from the group consisting of Al, Ti, W, In, Co, Au, Ni and Cr.

10. (original) A method for making a photodetector using a MOSFET with quantum channel, comprising the steps of:

forming an activated area on SOI wafer;

forming a quantum channel on the center of said activated area;

forming a gate oxide film on the SOI wafer with said quantum channel;

forming a source and a drain at both ends of said quantum channel; and

depositing metal layers after forming contacts on said source and said drain.

11. (original) The method as defined by claim 10, further comprising the steps of:

forming an additional gate on said gate oxide film by means of lithography;

and

depositing metal layers after forming contacts on said additional gate.

12. (currently amended) The method as defined by claim 10 ~~or claim~~ 44, wherein the step of forming an activated area is carried out by means of activated area mask, photolithography process, and etching process.

13. (currently amended) The method as defined by claim 10 ~~or claim~~ 44, wherein the step of forming a quantum channel is carried out by means of lithography technology including an etching process using a photomask.

14. (currently amended) The method as defined by claim 10 ~~or claim~~ 44, wherein the number of quantum channels formed is one or more.

15. (currently amended) The method as defined by claim 10 ~~or claim~~ 44, wherein the length of quantum channel formed is 1 nm ~ 1000 nm.

16. (currently amended) The method as defined by claim 10 ~~or claim~~ 44, wherein the width of quantum channel formed is 1 nm ~ 20 nm.